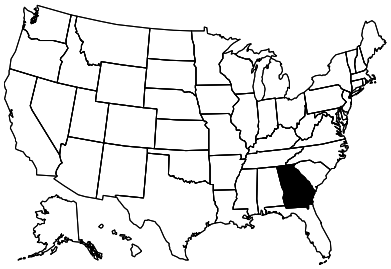
GEORGIA



Contact Information

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Program Description

The Georgia Department of Natural Resources (GA DNR) Environmental Protection Division (EPD) monitoring program integrates physical, chemical, and biological monitoring to provide information for water quality, use attainment assessments, and basin planning. EPD monitors the surface waters of the state to collect baseline and trend data, document existing conditions, study impacts of specific discharges, determine improvements resulting from upgraded water pollution control plants, support enforcement actions, establish wasteload allocations for new and existing facilities, verify water pollution control plant compliance, document water use impairment and reasons for problems causing less than full support of designated water uses, and develop TMDLs. Intensive surveys; lake, coastal, biological, fish tissue, toxic substance, and trend monitoring; and facility compliance sampling are the major monitoring tools used by EPD.

Long-term, trend, and ambient monitoring of streams at strategic locations throughout Georgia, was initiated by EPD during the late 1960s. This work was and continues to be accomplished to a large extent through cooperative agreements with federal, state, and local agencies who collect samples from groups of stations at specific, fixed locations throughout the year.

In 1995, EPD adopted and implemented significant changes to the strategy for trend monitoring in Georgia. The changes were implemented to support the River Basin Management Planning program. The number of fixed stations statewide was reduced in order to focus resources for sampling and analysis in a particular group of basins in any one year in accordance with the basin planning schedule. This approach provides the framework for identifying, assessing, and prioritizing water resource issues, developing implementation strategies, and providing opportunities for targeted, cooperative actions to reduce pollution, enhance aquatic habitat, and provide a dependable water supply.

The Watershed Planning and Monitoring Section of the EPD Water Protection Branch performs the following tasks:

- Conducts monitoring of Georgia streams, rivers, lakes and estuaries for use with wasteload allocations and to determine compliance with water quality standards;
- Develops River Basin Management Plans for river basins in Georgia;
- Conducts water quality modeling for wasteload allocations, water use classifications, and water quality standards in Georgia; and
- Collects samples of facility discharges for laboratory testing of samples.

Currently, reference site selection and biocriteria development are being carried out under contract with Columbus State University. The project is in Phase III with projected completion in 2003. The final phase, Phase IV, is projected to be completed in 2004.

Documentation and Further Information

Georgia's 2000 305(b) Report, *Water Quality in Georgia, 1998-1999;* the *Final Georgia 2000 305(b)/303(d) List Documents*, including *Summary of Changes from the 2000 to 2002 305(b)/303(d) List*, can be found under Georgia's Environment, Water Quality in the Table of Contents at the following site:
http://www.dnr.state.ga.us/dnr/environ/

2000. DRAFT *Standard Operating Procedures for Freshwater Macroinvertebrate Biological Assessment*. Georgia Department of Natural Resources, Water Protection Branch, Atlanta, GA.

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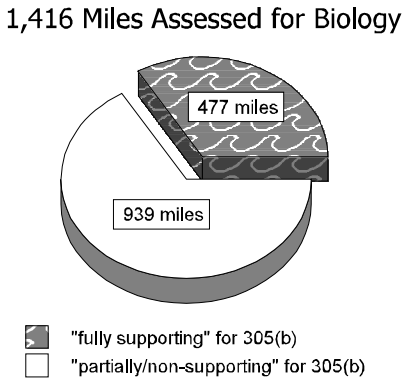
Programmatic Elements

Uses of bioassessment within overall water quality program	✓	problem identification (screening)
	✓	nonpoint source assessments
	✓	monitoring the effectiveness of BMPs
	✓	ALU determinations/ambient monitoring
	✓	promulgated into state water quality standards as biocriteria
	✓	support of antidegradation
	✓	evaluation of discharge permit conditions
	✓	TMDL assessment and monitoring
		other:
Applicable monitoring designs	✓	targeted (i.e., sites selected for specific purpose) *(specific river basins or watersheds)*
	✓	fixed station (i.e., water quality monitoring stations) *(specific river basins or watersheds, and comprehensive use throughout jurisdiction)*
		probabilistic by stream order/catchment area
		probabilistic by ecoregion, or statewide
	✓	rotating basin *(comprehensive use throughout jurisdiction)*
		other:

Stream Miles

Total miles *(determined using state based coverage)*	**70,150**
Total perennial miles	44,056
Total miles assessed for biology*	**1,416**
fully supporting for 305(b)	477
partially/non-supporting for 305(b)	939
listed for 303(d)	–
number of sites sampled *(in 2000)*	153
number of miles assessed per site	varies



*In 2000, 72 stations were sampled and a total of 477 miles were assessed as fully supporting for 305(b) (6.6 miles assessed/station); 75 stations were sampled and a total of 799 miles were assessed as partially supporting (10.7 miles assessed/station); 6 stations were sampled and 140 miles were assessed as not supporting (23.3 miles assessed/station). This results in a total of 153 stations and 1,416 stream miles assessed in 2000 (9.25 miles assessed/station). The stream miles listed above are not divided into those monitored for biology versus chemistry because 305(b) reporting requirements use both types of data. The sampling length per site varies and the length of stream represented by each sample is determined by the surrounding hydrography.

Aquatic Life Use (ALU) Designations and Decision-Making

ALU designation basis	Fishery Based Uses	
ALU designations in state water quality standards	Three designations: Coastal fishing; fishing, propagation of fish, shellfish, game, and other aquatic life; primary and secondary trout waters	
Narrative Biocriteria in WQS	Procedures used to support narrative biocriteria are located in the Environmental Protection Division's SOPs for macroinvertebrates and DNR/Wildlife Resources Division's IBI protocols for fish	
Numeric Biocriteria in WQS	none	
Uses of bioassessment data in integrated assessments with other environmental data (e.g., toxicity testing and chemical specific criteria)	✓	assessment of aquatic resources
	✓	cause and effect determinations
	✓	permitted discharges
	✓	monitoring (e.g., improvements after mitigation)
	✓	watershed based management
Uses of bioassessment/ biocriteria in making management decisions regarding restoration of aquatic resources to a designated ALU	Fish IBI and macroinvertebrate assessments were conducted to evaluate approximately 80 previously 303(d)-listed sites in the last two years. While some sites were removed from the list others, found to be impaired due to (clean) sediment deposition, remained on the list.	

Reference Site/Condition Development

Number of reference sites	**Reference site selection is under development.**	
Reference site determinations		site-specific
		paired watersheds
	✓	regional (aggregate of sites)
		professional judgment
		other:
Reference site criteria	Columbus State University is using several criteria for selecting reference sites, including minimum overall habitat score, managed land, urban land, minimum forested riparian zone width, forested riparian zone in catchment, silviculture activity, and point source discharges. Reference sites would be defined as least-disturbed according to these criteria.	
Characterization of reference sites within a regional context		historical conditions
	✓	least disturbed sites
		gradient response
		professional judgment
		other:
Stream stratification within regional reference conditions	✓	ecoregions (or some aggregate)
		elevation
		stream type
		multivariate grouping
		jurisdictional (i.e., statewide)
		other:
Additional information		reference sites linked to ALU
		reference sites/condition referenced in water quality standards
	✓	some reference sites represent acceptable human-induced conditions

Field and Lab Methods

Assemblages assessed	✓	benthos *(100-500 samples/year; single season, multiple sites - watershed level)*
	✓	fish *(100-500 samples/year; single season, multiple sites - watershed level)*
		periphyton
		other:
Benthos		
sampling gear	collect by hand and D-frame; 500-600 micron mesh	
habitat selection	multihabitat	
subsample size	200 count	
taxonomy	genus	
Fish		
sampling gear	seine, backpack electrofisher, pram unit (tote barge); 3/16" and 1/4" mesh	
habitat selection	Sample all habitats within a sample reach that is 35X the mean stream width. Habitat assessments are broken out between riffle/run and glide/pool based on the ecoregion in which the sample is located.	
sample processing	biomass – batch, anomalies	
subsample	none	
taxonomy	species	
Habitat assessments	visual based and zig-zag pebble count; performed with bioassessments	
Quality assurance program elements	standard operating procedures, quality assurance plan, periodic meetings and training for biologists, sorting and taxonomic proficiency checks	

Data Analysis and Interpretation

Data analysis tools and methods	✓	summary tables, illustrative graphs
		parametric ANOVAs
	UD	multivariate analysis
	✓	biological metrics *(aggregate metrics into an index)*
		disturbance gradients
		other:
Multimetric thresholds		
transforming metrics into unitless scores	under development	
defining impairment in a multimetric index	under development	
Multivariate thresholds		
defining impairment in a multivariate index	under development	
Evaluation of performance characteristics		repeat sampling
		precision
Not currently evaluated		sensitivity
		bias
		accuracy
Biological data		
Storage	EDAS and Excel	
Retrieval and analysis	EDAS	